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**APPLICATION FOR PATENT**

**A1**

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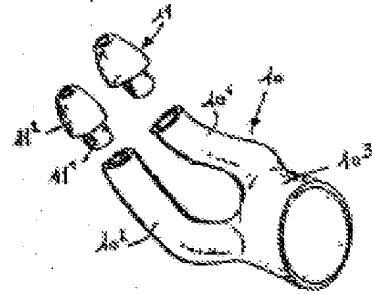
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54) Nasal adapter to fit all medical apparatus, in particular nebulisers

57) The adapter is characterised in that it comprises at least one arm 10.1 made in a flexible deformable material, having a base 10.3 connecting to a means of distributing a therapeutic fluid, said arm 10.1 having a cap at its extremity with the external shape of a flared skirt 11.2 such that it can form a leak-tight seal with the opening of the patient's nostril.



The aim of the invention is to propose a nasal adapter to fit all medical apparatus, in particular nebulisers.

The invention is connected to the working section of the medical equipment and accessories before being introduced into the nose to allow the distribution of a fluid such as air, aerosols and similar substances.

Adapters of this type are known already for nasal uses which can be connected, for example, to nebulisers, atomisers or at the end of tubes for distributing fluids for medical applications. Figures 1 and 2 show drawings of a first example of an adapter of this type used to date. The adapter shown can be attached to, amongst others, nebulisers, and comprises a tubular body (1) shaped as a sleeve. The sleeve consists of a central collar (1.1) on each side of which it has the means of connecting with tubes made in a flexible material. It comprises a lower base (1.2) preferably conical in shape over which a tube (2) fits which connects to the source of the fluid or, alternately, which can fit over the nozzle (3) of a nebuliser (4). Two parallel, conical outlets (1.3) project from the other side of the collar which are hollow internally to be able to fit over a tube (5) respectively. At their other ends (5.1), said tubes fit over an olive-shaped fitting (6), possibly with a shoulder, and hollow to allow fluid to pass through. Each fitting comprises a conical or similarly-shaped rear part (6.1) to fit into the tube (5). The front part of the fitting is elongated to form a nozzle (6.2) so that it can fit inside the patient's nostril. The sections forming the nozzles (6.2) may have a flat area (6.3) to adjust to the internal shape of the nostrils. This body and the olive-shaped fittings are made in a stiff but deformable material.

An adapter of this type has several disadvantages.

It consists of at least three types of elements: the body, the intermediate tubes and the olive-shaped fittings.

Designed in this way, the olive-shaped fittings project into the nostrils and do not provide a leak-tight seal when the fluid is injected. Since the shape of patients' nostrils vary, so will the space between the peripheral area of each inserted fitting and the internal wall of the nasal passage. The diameter of the tubes is reduced, thus lessening the distribution of aerosols.

Furthermore, since the olive-shaped fittings are stiff, they may injure the internal walls of the patient's nose which, as is known, are extremely delicate.

Another disadvantage arises from the fact that the two olive-shaped fittings, being attached to the two parallel projections, cannot deliver a suitable ejection of the fluid in the nostrils. Actually, the ejection of the fluid does not penetrate deeply but more often is directed against the ala of the nose or, conversely, against the nasal septum, or, again, the ala of the nose may block the apertures in the nasal adapter.

Designed as it is, the nasal adapter is bulky, large and thus cumbersome.

Fig. 3 illustrates another version of the type used to date. The body is formed as a stiff monobloc with two projections to which are fitted the tubes on which the olive-shaped fittings are attached.

The task of the invention is therefore to resolve these disadvantages by proposing an innovative, practical and hygienic solution at a low manufacturing cost.

This solution is achieved by the nasal adapter according to the invention.

According to a first characteristic, the adapter is characterised in that it comprises a body having at least one arm made in

a flexible deformable material, having a base connecting to a means of distributing a therapeutic fluid, said arm having a cap at its extremity with the external shape of a flared skirt such that it can form a leak-tight seal with the opening of the patient's nostril.

According to another characteristic, the adapter is notable in that it comprises a body shaped in the form of forks having at their ends a cap-shaped element.

These characteristics and others besides will emerge in more detail as the description continues.

The subject matter of the invention is illustrated but not restricted to the drawings in the figures, where:

Fig. 1 shows a side view of a nasal adapter according to the earlier type which can be fitted to a nebuliser.

Fig. 2 is an exploded perspective view of the nasal adapter according to Fig. 1.

Fig. 3 is an alternative version of the earlier type.

Fig. 4 is a plan view of the nasal adapter according to the invention.

Fig. 5 shows a side view of the nasal adapter according to the invention.

Fig. 6 is an exploded perspective view of the nasal adapter according to Figures 4 and 5.

In order to describe the subject matter of the invention in more concrete terms, the description will now continue by illustrating examples of physical embodiments of the items in the drawings, but without limiting the invention to these embodiments.

The nasal adapter (10) according to the invention is arranged with a body in the shape of a fork with two arms (10.1 – 10.2) as a monobloc made in a flexible, plastic and deformable material. The base

(10.3) of the adapter is intended to fit over the tube of an aerosol nebuliser, for example, or other devices used for medical or therapeutic purposes. A cap (11) in the shape of a mushroom or a corolla is disposed at the end of each of the arms of the fork arranged for this purpose. Thus, each cap has a cylindrical central region (11.1) which can be attached to each end of the arms of the fork by gluing, inserting or some other means. The cylindrical region continues at its external side into an inverted skirt (11.2) with a conical shape, widening and covering all or a part of the cylindrical region (11.1). Said cap (11) described in this way is preferably made in a plastic material more pliable than that material of which the fork-shaped body is formed. Furthermore, it is flexible. Under these conditions, it can be seen that the cap which can adapt itself to the entrance to the nostril will firstly ensure complete leak-tightness, wherein its external skirt will fit against the visible external part at the entrance to the nostril. Moreover, since it is flexible, it will not injure the patient's nasal walls. Due to the height of the skirt and, thus, the potential sealing surface, the cap can shape and centre itself to fit all nostrils, regardless of the patient's physical configuration.

The size of the tubes and orifices in the cap remain large since the cap does not have to enter deep into the nostrils. The emission of the fluid is not impeded therefore.

According to another characteristic, the two arms of the fork are preferably not parallel and, on the contrary, are shaped in a slight curve as in Fig. 4, wherein the ends holding the caps tend to turn in towards each other, converging to allow the caps to engage with the entrance to the nostrils. Furthermore, according to another arrangement, the arms of the fork are directed in the other axial plane with the radius of the curve tending to raise the position of the parts holding the caps to maintain any nebuliser in a vertical position. The fork is made in a

flexible material, enabling it to rest against the nasal septum to provide leak-tightness. Thus, in this combined position, the caps are positioned exactly in the median axial plane of the nostrils and will allow the distribution of the therapeutic fluid deep into the nasal passage.

The advantages according to the invention thus emerge from the description.

Firstly, the number of parts required for the nasal adapter are reduced to just two: the body in the shape of a fork and the cap.

Complete leak-tightness is assured where the cap meets the entrance to the nostril which enables other therapeutic treatments to be administered due to the leak-tightness obtained.

The caps do not injure the patient.

The internal diameters of the tubes are large, providing optimal delivery of fluid.

Without departing from the substance of the invention, the adapter can be made in one piece. Furthermore, an adapter with two arms has been described. Depending on the application, the adapter can be made with just one arm.

## CLAIMS

1. Nasal adapter which can be fitted to medical equipment, characterised in that it comprises a body having at least one arm (10.1) made in a flexible deformable material, having a base (10.3) connecting to a means of distributing a therapeutic fluid, said arm (10.1) having a cap (11) at its extremity with the external shape of a flared skirt (11.2) such that it can form a leak-tight seal with the opening of the patient's nostril.
2. Nasal adapter in accordance with claim 1, characterised in that it comprises a body shaped in the form of forks (10.1 – 10.2) having at their ends a cap-shaped element (4).
3. Nasal adapter in accordance with one of the claims 1 and 2, characterised in that each cap (11) has a cylindrical central region (11.1), with a relatively large internal diameter, fitted to the end of the arm(s) of the body, whereby the cylindrical region continues at its external side into an inverted skirt (11.2) with a conical shape, widening and covering all or a part of the cylindrical region (11.1).
4. Nasal adapter in accordance with claim 3, characterised in that the cap(s) is/are attached to the arm(s) of the body and are made in a plastic material more pliable than that material of which the fork-shaped body is formed, and are flexible.

5. Nasal adapter in accordance with claim 2, characterised in that the two arms of the fork comprising the body are made in a flexible material and are not parallel and are shaped in a slight curve, where the ends holding the caps are convergent, tending to turn in towards each other.
  
6. Nasal adapter in accordance with claim 5, characterised in that the arms of the fork are directed in the other axial plane with the radius of the curve tending to raise the position of the parts holding the caps.

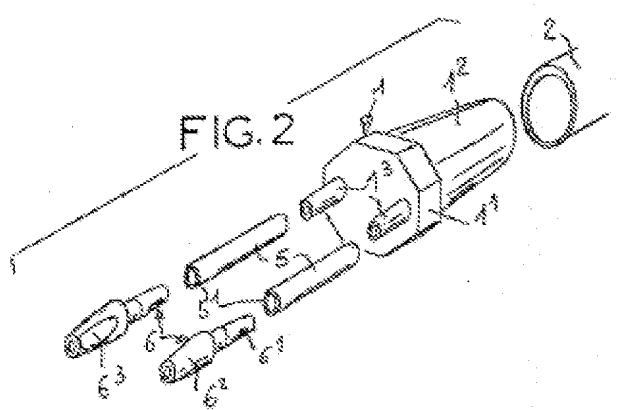
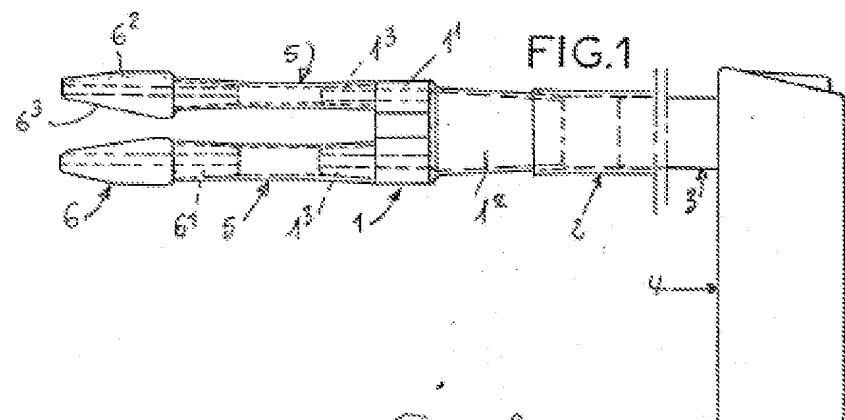


FIG. 3

